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Cleaner Production Workshops

Consultant's Report

CLEANER PRODUCTION WORKSHOPS

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Submitted by:

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1 INTRODUCTION

In September 2002, under U.S. Agency for International Development (USAID) auspices, IRG initiated cleaner production (CP) training for the Secretariat of the Environment and Natural Resources (SEMARN) with three CP workshops for SEMARN managers and representatives of companies in Santo Domingo and Santiago. Following up on this effort and as part of its technical support to USAID's Improving Policies for Environmental Protection (IPEP) program in the Dominican Republic (DR), IRG contracted Foster Knight (hereafter "consultant") to support additional CP workshops in the DR during the week of November 17–21, 2003.

This report covers the consultant's activities leading up to and during the presentation of the November 2003 CP workshops, as well as recommendations for follow-on CP initiatives.

2 SETTING

2.1 Public Sector Activity

SEMARN has been working on various CP initiatives ever since it was established in 2000. An important part of this work has been SEMARN's development of environmental regulations and technical norms. SEMARN's emerging environmental regulations are beginning to have the effect, among others, of motivating company managers to improve their environmental performance. Enforcement of environmental regulations is thus starting to motivate companies to look into the potential for improvements achievable through CP methods.

An important environmental enforcement mechanism is the “environmental operating permit” (*permiso ambiental*) for industrial operations established before enactment of the General Environmental Law 64-00. Established operations are required to conduct environmental reviews of their operations and obtain an environmental operating permit. Because SEMARN's staff is quite limited, it prioritizes permits for industrial operations based on public complaints. When they receive a complaint about a specific operation, SEMARN inspectors visit the facility, review (and sometimes close down the offending production process), and initiate the environmental review and corrective process that leads to issuance of an environmental operating permit. According to SEMARN, as of November 2003, some 100 industrial operations have been issued environmental operating permits and another 900 are in process. These industrial operations with environmental operating permits, in a sense, are the emerging group of companies that more likely than not will be interested in CP initiatives. For example, the *permiso ambiental* requirement applied to a local glass manufacturer (Productos Zanzibar) has been influential in getting that company to initiate its own environmental policy and a glass recycling program.

2.2 Private Sector Activity

Relatively few national companies are actively involved in introducing CP initiatives, and relatively few companies are actively engaged in implementing ISO 14001 environmental management systems. Nevertheless, there are

(perhaps) a dozen or more environmental leader companies that understand CP concepts and their relationship to improved competitiveness.

- ◆ Multinational enterprises with operations in the DR are important drivers for environmental improvement actions. *Zona franca maquila* plants tend to be more focused on actions ensuring compliance.
- ◆ Some tourism entrepreneurs are in the vanguard in developing environmentally superior operations, particularly in the east. The economic downturn for hotels in the Puerto Plata area is increasingly connected to poor environmental performance. That, in turn, reinforces the business wisdom of focusing on superior environmental performance in the eastern resorts.
- ◆ Multinational companies continue to be quite influential in introducing higher standards of environmental management. For example, Coca Cola is introducing reusable glass bottles for its soft drinks, and multinationals with *zona franca* operations are introducing more advanced environmental management requirements for their *maquila* operations to protect their “license to operate.”

In summary, SEMARN is setting the stage for greater involvement of business operations in CP methods. A few large national companies are voluntarily moving ahead with CP for business reasons (improving their market, reducing operating costs, and increasing competitiveness). Multinationals are transferring environmental improvement “technology” to their Dominican operations. Nevertheless, a very high percentage of medium to large national companies are still operating inefficiently and are ignorant of the improvement possibilities through inexpensive CP techniques. So-called “informal” businesses (micro and small) provide most of the DR’s private sector employment, have the poorest environmental performance, and present the greatest challenge to improving policies for environmental protection.

3 CLEANER PRODUCTION

WORKSHOPS FOR INDUSTRY REPRESENTATIVES

3.1 Cleaner Production “Success Stories”

In preparing for the November 2003 workshops and in consultation with workshops sponsor Dr. René Ledezma, Sub-Secretary for Environmental Management at SEMARN, IRG proposed to invite several companies with demonstrated CP successes to present their CP experience at workshops for DR company representatives. Hearing the CP message directly from other company managers would be more effective than hearing the message from a CP expert.

With that in mind, IRG asked the consultant to identify several companies to be invited to the DR to present convincing stories on their CP experience, with an emphasis on the economics of CP (costs and benefits and “internal rate of return” or IRR).

Through contacts in Colombia, Costa Rica, Nicaragua, and Mexico, the consultant identified large and small companies that had invested in CP techniques for at least two years. From this group, the consultant identified two candidate companies in Costa Rica that had invested in CP with assistance from Costa Rica’s National Center for Cleaner Production. After qualifying these companies by determining their willingness to travel to the DR and present their experience in workshops, the consultant proposed the two candidate companies to IRG and their accompaniment by a representative from the Costa Rican Cleaner Production Center. IRG then managed the logistics involved in bringing the Costa Rican companies to the DR.

To organize the CP workshops, SEMARN’s Sub-Secretariat for Environmental Management contacted the Cámaras de Industria y Producción for Santo Domingo and Santiago and requested their assistance in inviting company representatives from these two regions to participate in two CP workshops scheduled for Tuesday, November 18, 2003 in Santo Domingo and Wednesday, November 19, 2003 in Santiago.

To prepare for the two workshops, the consultant, IRG, and SEMARN representatives (Dr. René Ledezma, Rafael Veloz, and Luis Mejía) met on Monday, November 17, 2003 with the Costa Rican company managers and the Costa Rican Cleaner Production Center representative to review proposed presentation materials and finalize planning for the workshops.

3.2 Cleaner Production Workshops for Dominican Companies

The first workshop, facilitated by the consultant, was conducted at the Universidad Nacional Pedro Hernandez Ureña (UNPHU) on November 18. Approximately 40 representatives of companies in the Santo Domingo area attended. Bill Kaschak from IRG, USAID Director Dr. Elena Brinnerman, and Dr. René Ledezma provided brief opening remarks on USAID's "Improving Policies for Environmental Protection" (IPEP) program and the importance of the CP initiative supporting SEMARN's National Policy on Cleaner Production.

The workshop presentations are summarized below:

3.2.1 COSTA RICA'S NATIONAL CENTER FOR CLEANER PRODUCTION

The technical director of Costa Rica's National Cleaner Production Center, Carlos Perera, delivered an opening presentation summarizing the Cleaner Production Center's experience since its initiation in 1998:

- ◆ Assisted three companies in introducing CP during its first year;
- ◆ 15 companies in the second year;
- ◆ 29 companies in the third year;
- ◆ 44 additional companies in the current year.

Among other initiatives, the Cleaner Production Center has analyzed the principal waste streams in the country and produced the report *National Report on Materials Management*, financed by USAID and Proarca Sigma.

3.2.2 THE EQUIPOS EL PRADO CASE STUDY

Following the Cleaner Production Center presentation, Alfredo Salazar, engineering manager for the Costa Rican metalworking company Equipos El Prado, presented that company's experience with cleaner production during the past three years.

Equipos El Prado is a small company (60 employees) that manufactures industrial equipment for transporting products during production. Starting out with roller conveyors, the company has expanded into banana transport systems during harvesting and conveyors for handling fresh flower harvesting.

Prior to initiating cleaner production techniques, Equipos El Prado's principal environmental issues included the following:

- ◆ Fire hazard during steel-tempering processes that used oil as a coolant;
- ◆ Wastewater contaminated with oil and hexavalent chromium;
- ◆ Inefficient use of electrical energy;
- ◆ Solid waste from unusable metallic remnants.

The Equipos El Prado presentation demonstrated the significant environmental and economic benefits of introducing cleaner production methods with the assistance of the Cleaner Production Center:

- ◆ Substituting a polymer for oil in the steel-tempering process completely eliminated the fire hazard and an important source of waste oil, resulting in significant productivity improvements (a nearly 50% reduction in the time needed to prepare the cooling process and a 75% reduction in the time required for cleaning tempered steel);
- ◆ Insulating galvanizing equipment resulting in a 73% reduction in energy usage and a 20% reduction in water usage (with a return on investment [ROI] in six weeks);
- ◆ Initiating recycling of waste steel resulting in avoidance of \$350/month in waste disposal costs;
- ◆ Reprocessing aluminum scrap into new saleable products (calipers);
- ◆ Replacing oil-cooling fluids with a biodegradable coolant and eliminating the need to treat wastewater contaminated with oil;
- ◆ Substituting chrome 3 for hexavalent chromium in the galvanizing process, substantially reducing wastewater treatment costs.

Equipos El Prado has initiated efforts to implement an environmental management system that will support continual improvement of its cleaner production initiatives.

Judging by the questions asked by workshop participants, the Equipos El Prado presentation was well received. Participants seemed quite impressed by the kinds of low-cost, high-return cleaner production techniques that a small company can successfully implement.

3.2.3 COOPERATIVA DOS PINOS CASE STUDY

Gerardo Rojas, environmental manager of the Dos Pinos San Carlos plant, presented Cooperativa Dos Pinos' experience with cleaner production. Dos Pinos, with some 3000 employees, is the largest milk product processor in Costa Rica.

Beginning in 2001, the San Carlos plant began implementing an environmental management system (EMS) with the objective of obtaining ISO 14001 certification. During the EMS implementation process, the EMS implementation Committee with technical assistance from the Cleaner Production Center identified and implemented important cleaner production opportunities:

- ◆ *Electrical energy conservation.* With an initial investment of \$13,000, the plant has achieved annual energy savings of \$32,000, resulting in an ROI of 6 months.
- ◆ *Fuel conservation.* With an initial investment of \$5,000, the plant achieved reductions of 7.5% in fuel usage and 127 tons/year in CO₂ emissions, resulting in \$9,000 in annual savings and an ROI of six months.
- ◆ *Water conservation.* Low-cost cleaner production techniques have enabled the plant to reduce its water usage by 50%, resulting in an estimated annual savings of \$138,000 and an additional \$7,500 in energy savings from reduced use of water pumps.
- ◆ *Reduced wastewater effluents.* By diverting milk by-products in the wastewater stream, the plant has reduced its chemical oxygen demand effluents by 77%, resulting in estimated savings of \$137,000 in chemical oxygen demand surcharges that will be going into effect in 2004. The milk by-products are reconstituted as animal feed, resulting in a new source of income. In addition, the plant will save an estimated \$1 million in avoided wastewater treatment costs by being able to downsize the originally planned wastewater treatment plant expansion.
- ◆ *Waste reduction through improved materials management.* The plant has achieved an annual reduction of \$16,000 in materials and waste management costs.

Cooperativa Dos Pinos is now in the process of extending its EMS to its much larger milk-processing plant in central Costa Rica. Preliminary estimates indicate that the company will be able to achieve more than \$2 million annually in savings by implementing similar cleaner production methods at their larger plant.

Copies of the Equipos El Prado and Cooperativa Dos Pinos presentation materials are in annex 1.

3.2.4 WORKSHOP FEEDBACK

During the last hour of the workshop, the consultant facilitated an interactive discussion among participants. Comments from the participants indicate that they were clearly receptive to the benefits of cleaner production and appeared to understand how many cleaner production methods are relatively inexpensive to implement and result in important savings.

The consultant provided participants with a list of different types of barriers impeding implementation of cleaner production methods in the DR and asked each participant to identify five “most significant” barriers.

On Wednesday, November 19, the same cleaner production workshop was presented at the Cámara de Industria y Producción facility in Santiago. Despite earlier indications that as many as 50 company representatives would come to the event, only nine people attended. Nevertheless, feedback from this small group at the end of the presentations indicates that the cleaner production examples presented were understood and well received.

To ensure greater attendance at future cleaner production workshops in Santiago, other company associations in the Santiago region should be contacted.

4 CLEANER PRODUCTION

TRAINING WORKSHOP FOR THE INTER-INSTITUTIONAL COMMITTEE

As part of a broader effort to develop its National Policy on Cleaner Production, SEMARN established an Inter-Institutional Committee of representatives from the public and private sectors, including NGOs, to serve both as an advisory body to SEMARN on cleaner production and to develop specific national, regional, and sectoral cleaner production initiatives. The Secretary of SEMARN formally established the Inter-Institutional Committee by resolution in July 2003.

Sub-Secretary for Environmental Management Dr. René Ledezma requested assistance from USAID in training the Inter-Institutional Committee on cleaner production concepts and possible initiatives the committee might undertake.

With that in mind, IRG asked the consultant to prepare cleaner production training materials and conduct a two-day workshop for committee members.

The workshop was conducted on Thursday, November 20, and Friday, November 21, at UNPHU facilities. Almost all committee members attended (32 of 35).

Dr. René Ledezma gave opening remarks to the committee on the importance of the Inter-Institution Committee in shaping the future of the National Policy on Cleaner Production. Rafael Veloz (SEMARN's Cleaner Production Program Manager) handed out copies of the resolution establishing the committee and briefly reviewed some of the committee's functions.

The consultant presented the first workshop module "Introduction to Cleaner Production" covering the context of CP in sustainable development, how and where CP got started in industrialized countries during the 1980s, how CP fits with national environmental policy in developing countries, and how CP, implemented in individual company operations supports national environmental policy. The first workshop module also covered details of CP implementation methodologies in a facility.

Bill Kaschak and the consultant copresented the second module covering instruments of CP policy, including regulatory, economic, voluntary action, and information-based instruments.

During the second day of the workshop, the consultant presented three additional modules:

- ◆ CP developments in North America, Europe, and Latin America, including CP national policy development and initiatives in Chile, Colombia, and Guatemala;
- ◆ Centers for Cleaner Production experience in Latin America, including strengths and weaknesses;
- ◆ Developing a national CP policy in the context of the Inter-Institutional Committee's role.

Annex 2 presents the consultant's PowerPoint presentation materials.

During the last part of the presentation, the consultant engaged the committee in an exercise to identify the principal barriers to implementing CP in the DR. Each participant was asked to identify the five most significant barriers on a list provided (or add new barriers not identified on the list) and then rank the five selected in terms of their relative importance.

The committee members identified the following barriers in order of importance:

1. Lack of awareness of CP benefits by companies and the general public;
2. Difficulty of measuring CP benefits and how to conduct cost/benefit analyses;
3. Lack of financing and inexpensive credit for CP;
4. Lack of a Center for Cleaner Production in the DR;
5. Inadequate focus on CP within government agencies (CP is insufficiently integrated in other government policies, and government officials do not have a sufficiently long-term view of the benefits of CP).

The consultant then reviewed committee roles and responsibilities as defined in the resolution creating the committee. The consultant facilitated a discussion of possible committee initiatives using a table showing examples of types of initiatives for each committee responsibility (see annex 3).

At the conclusion of the workshop, the consultant facilitated a discussion of how the committee should organize itself for action. The consultant asked for a volunteer to serve as the committee chair to convene future meetings. Dr.

Moisés Alvarez, UNPHU's Coordinator of Post-Graduate Programs, agreed to serve as Chair. His nomination was approved by voice vote.

Moisés then asked the committee to agree on the next meeting to establish subcommittees and agree on priority initiatives and action plans.

The committee agreed to schedule its next meeting at the UNPHU facility on December 10, 2003, from 10:00 a.m. to 12:00 p.m.

5 RECOMMENDATIONS

SEMARN has prepared a draft National Cleaner Production Program, which identifies different initiatives for promoting cleaner production. Of these, the consultant recommends giving highest priority to the following:

5.1 Establishing a Cleaner Production Center in the Dominican Republic

SEMARN should support planning and organizational efforts leading to establishing a Cleaner Production Center (CPC) in the DR.

The recommended model for the CPC is a nonprofit organization that is sponsored by a university or industry trade association. The CPC would serve as a clearinghouse for CP information and “best practices.” The CPC would hire a small, full-time staff of cleaner production specialists whose primary function would be providing CP consulting services to Dominican companies interested in improving their environmental and financial performance through CP. The CPC would require funding for three to five years until it could become financially self-sustaining through its consulting services.

Because financial self-sufficiency is critical to the successful establishment of a Cleaner Production Center, the first step toward implementing this recommendation should be a market study to evaluate the willingness of Dominican companies to pay for CP consulting services, including consulting on improving efficiency of energy and water usage. Of course, one of the reasons for establishing a CPC is to provide a focal point for increasing awareness of CP benefits and, in that way, to help build “market demand” for CP. But unless there is a “critical mass” of market demand for CP in the DR, there is considerable risk that the CPC could not achieve financial independence in three to five years after startup.

A second important step is to identify the appropriate sponsor for the CPC. The Cámara de Industria y Producción in Santo Domingo has expressed interest in becoming a CPC sponsor. Would the Cámara be willing to provide counterpart funds, including in-kind contributions, to help fund a CPC for the first three to five years?

The Inter-Institutional Committee established by SEMARN to promote cleaner production initiatives should take the lead in identifying candidate CPC sponsors, including the Cámara de Industria y Comercio.

Funding a CPC for three to five years will require funding commitments in the range of \$500,000 to \$800,000, depending on the total time and the number of CPC consultants hired.

Multilateral donor agency sources of funding for a CPC include the Multilateral Investment Fund (MIF) of the Inter-American Development Bank, UNIDO, and UNEP.

5.2 Promote Voluntary Cleaner Production Agreements

An effective way to increase private sector awareness of the financial and environmental benefits of cleaner production is through targeted voluntary agreements signed by SEMARN and individual participating companies. The purpose of a voluntary agreement is to get commitments from participating companies to take voluntary actions to introduce CP in their operations toward reaching a common goal, such as reducing wastewater effluents by 20% in two years.

SEMARN, either directly or through its Inter-Institutional Committee for CP, should identify one or two priority industry sectors or begin the process of recruiting companies willing to participate.

The recruiting process needs to be handled carefully. The most effective approach is to identify one or two industry leaders in the targeted sector, convince them of the merits of the voluntary agreement concept, and ask them to take the lead in recruiting other companies.

If the voluntary agreement program is publicized (particularly the participation of industry leader companies), marketplace and competitive dynamics often work to attract the participation of other companies in the sector who do not want to be perceived as “not interested in environmental improvement.”

Setting the environmental improvement goal for the voluntary agreement requires active participation of companies in the sector and should also be facilitated by a cleaner production specialist who is familiar with types of CP opportunities in the sector and can help set realistic stretch goals.

There are various voluntary agreement models that can be used. Chile has advanced the voluntary agreement approach as much as any country in the Latin

American and Caribbean region. Chile currently has established seven sectoral voluntary agreements, copies of which SEMARN has already obtained.

The voluntary agreements for pig farms (Producción de Cerdos) and the framework agreement for the agroindustrial sector would appear to be appropriate to environmental improvement priorities in the DR. Other examples are in the United States. The U.S. Environmental Protection Agency (USEPA) has established more than 40 different “partnerships for the environment” voluntary programs, many of which are sectoral (e.g., construction industry). The form of the agreements, nature of company commitments, performance measurement approaches, and similar details can be provided through USEPA’s Office of International Activities.

5.3 Establish a National Environmental Performance Award

This recommendation involves establishing a voluntary program for recognizing industrial companies that meet the criteria. The program should have at least two levels:

- ◆ The first level would be for companies that meet basic criteria (for example, have received environmental operating permits and have completed implementing improvement activities specified in the permit. The first level would essentially recognize companies that are in compliance with applicable environmental regulations.
- ◆ A second level would be reserved for “environmental leader” companies that can demonstrate superior environmental performance, that is, improvements beyond what is required by environmental regulations.

SEMARN would need to prepare a regulation that defines the program, the application process, award criteria, and similar details.

5.4 Promote ISO 14001 Environmental Management Systems

Relatively few national companies have established environmental management systems (EMS) in conformance with the ISO 14001 standard.

Implementing an ISO 14001 EMS is the management vehicle for introducing cleaner production systematically within company operations; therefore, an

important component of SEMARN's national cleaner production strategy should be promotion of ISO 14001 EMSs.

Given that so few national companies with EMSs exist, SEMARN should directly or through the Inter-Institutional Committee promote a "Club 14000," that is, a group of 14 national companies whose chief executive officers (CEOs) commit to implementing an ISO 14001 EMS. Companies signing up to participate in the club would get favorable publicity. USAID could help by funding group EMS implementation training workshops, although the participating companies should be required to pay part of the EMS training costs. Group EMS training would include how to identify CP opportunities and techniques and best practices for achieving cost-effective CP results.

Once again, an effective approach to organizing something like a "Club 14000" is to identify one or two company CEOs who are viewed as environmental leaders and then convince them of the merits of the initiative. Their initial role would be personally to recruit the CEOs of enough other companies to round out the membership of the "Club 14000."

Assuming that a "Club 14000" is successfully initiated, the program can be expanded in year two by getting club member companies to invite their preferred suppliers to participate in a similar EMS implementation effort. In this way, EMS and CP techniques can be spread to smaller companies in the supply chain.

Article 67 in the national environmental law (Ley 64-00) specifies that companies implementing ISO 14001 EMSs will be eligible for regulatory benefits to be specified in an implementing regulation. The implementing regulation has not yet been prepared. The Club 14000 initiative will provide an opportunity for SEMARN to evaluate environmental performance improvements achieved through EMS implementation and, through "lessons learned," help design an appropriate regulation that specifies regulatory benefits.

5.5 Cleaner Production for Micro and Small and Medium Enterprises

Probably more than 60% of the total pollution load from private sector activities in the Dominican Republic is generated by micro and small and medium enterprises (SMEs). It will be important, therefore, for SEMARN to show some CP initiatives for these businesses.

One recommended initiative is to target the highest priority SME polluters such as car battery manufacturers and furniture makers. SEMARN can at once

threaten enforcement, including closing down illegal operations, while offering training assistance in helping them to reduce their environmental releases. This initiative would require funding CP workshops customized to the technical issues facing these high-polluting enterprises.

Another recommended initiative is to organize groups of up to 25 SMEs located in close proximity and provide them group training in EMS implementation. This initiative would require some initial fieldwork to identify the incentives (apart from the stated financial and environmental performance improvements from EMS implementation) that would motivate the SMEs to participate in EMS implementation. For example, SMEs that supply larger company customers would be motivated to participate in EMS implementation if their larger company customers strongly urged them to do so. In other situations, the local community can provide the necessary leverage to induce SMEs to participate.



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